UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,368	02/01/2001	Paul Joseph Stewart	200-1451	8120

7590   08/14/2003

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EXAMINER
NELSON, ALECIA DIANE

ART UNIT	PAPER NUMBER
2675	

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DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>01 February 2001</u> .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

     If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All b)☐ Some * c)☐ None of:

         1.☐ Certified copies of the priority documents have been received.

         2.☐ Certified copies of the priority documents have been received in Application No. _____ .

         3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

     a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1.   The information disclosure statement (IDS) submitted on 02/01/01 has been

considered by the examiner.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

3.   ***Claims 1-20*** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Zilles et al. (U.S. Patent No. 6,111,577).

With reference to **claims 1, 3, 4, 6, 7, 11, 12, and 15-17**, Zilles teaches a method and apparatus for determining forces to be applied to a user through a haptic interface, wherein in one embodiment the step of generating a representation of an object in graphic space includes defining the object as a mesh of planar surfaces and associating surface condition values to each of the nodes defining the planar surfaces. In another embodiment, the step of generating a representation of an object in graphic space includes describing the surface of the object using a coordinate system and associating surface condition values with each set of coordinates of the coordinate system (see abstract). The computer system, includes a processor, a user input device and a display device (see column 18, lines 45-56), generating a computer generated geometric model of the virtual object (see column 4, lines 15-26), and a haptic interface operatively in communication with the computer system, wherein the haptic interface includes a haptic device for transmitting information between a user and the geometric model (see column 6, lines 3-22), and wherein a haptic device position and orientation are acquired with respect to a surface of the geometric model (column 15, lines 60-64), and mapped into a geometric model coordinate reference system (see column 17, lines 30-38), a closest point position and orientation on the surface of the geometric model to the haptic device position is determined (see column 17, lines 39-50), a surface property at the closest point position and orientation is extracted (see column 17, line 60-column 18, line 5), and a property-feedback force is determined and applied to the haptic device to the hand of the user in relation to the surface of the geometric model (see column 18, lines 43-47).

Zilles fails to specifically teach that the system includes a memory, however it would be inherent that a computer system has a memory device. Furthermore, in a system as taught by Zilles it would be necessary for there to be a memory device to store the haptic sensations, geometric representations of the real object, software programs, algorithms for calculating force, and the coordinate system. Zilles also fails to specifically teach generating a stick-to-surface force, however does teach the application of different surface "feels", as well as the a stiffness force on a virtual object surface (see column 6, lines 44-68). Furthermore, with the proper usage of detecting the haptic interface point in graphic space, algorithms, or impedance control techniques to generate a stick-to-surface force or any other surface force, i.e., smoothing, bumps, concaved, solid, flexible.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow the device of Zilles to include the memory device as explained above, and have the ability to generate a stick-to-surface force in order to provide a haptic interface system which provides touch interfaces which accurately replicate the touch sensations a user would experience in the real world and thereby allowing the virtual object to "feel" more realistic.

With reference to **claims 2, 13, 14 and 20**, Zilles teaches the usage of a display (150) wherein the object is represented in graphic space and describes a virtual environment using a coordinate system (see column 17, lines 30-32).

With reference to **claim 5**, Zilles fails to teach the usage of a memory, however it would be inherent for such a device to include a memory as explained above with reference to **claim 1**. Zilles further teaches that CAD software is used to generate the representation of the object (see column 4, lines 33-35). After generation a representation of the object in graphic space (step 10), the sensors of the haptic interface system sense the position of the user in real space (step 12).

With reference to **claims 8, 9, 10, 18, and 19,** it is taught that one of many types of planar surface and shapes can be used in forming the virtual object (see column 15, lines 40-56), which would allow for determining a surface curvature at the closest point position and orientation. It is also taught determining a surface normal (see column 16, lines 56-62). Further it is taught that after defining the positions of nodes (A-C) on the planar surface, the interpolation scheme is used for converting the detected position into a vector (see column 16, lines 18-25).

Conclusion

4.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alecia D. Nelson whose telephone number is (703)305-0143. The examiner can normally be reached on Monday-Friday 9:30-7:00.
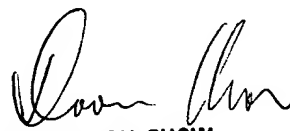
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Saras can be reached on (703)305-9720. The fax phone numbers for

the organization where this application or proceeding is assigned are (703)872-9314 for

regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703)305-

9700.

adn/ADN
August 11, 2003

DENNIS-DOON CHOW
PRIMARY EXAMINER